REMARKS

Reconsideration is respectfully requested. Claims 1-20 were pending in the application with claims 21-30 being cancelled. Claim 31 has been added. Claims 1-20 and 31 are now pending for examination. No new matter has been added.

Declaration of Wai Ming Choi

In the Answer to the Appeal Brief mailed July 28, 2009, it is suggested that the appellant made misleading statements that contradict the assertion that a two-step pH adjustment is not critical or essential to the practice of the invention.

Applicant is filing herewith a Declaration ("the Choi IV Declaration") by Wai Ming Choi to clarify certain points related to this issue. The Choi IV Declaration is being provided to correct certain inaccurate statements in the previous Declarations filed on March 7, 2007 ("the Choi I Declaration") and October 4, 2007 ("the Choi II Declaration"). The Choi IV Declaration notes that at the time Wai Ming Choi made the statements in Choi I and II Declarations, he had believed them to be accurate as the statements were consistent with many examples and embodiments described in the above-referenced patent application and the Declarations. The Choi IV Declaration further states that Wai Ming Choi did not willfully make any inaccurate statements and had no intent to deceive the United States Patent Office when making the statements.

The inaccurate statements suggest that the only way to obtain a filter media having a gamma value of at least about 14 is to adjust the pH from an acidic pH to an alkali pH. While many examples and embodiments described in the above-referenced patent application and the Choi II Declaration do obtain a gamma value of at least 14 by adjusting the pH from an acidic pH to an alkali pH, this technique is not the only way to obtain a filter media having a gamma value of at least about 14. Other means for obtaining a filter media having a gamma value of at least about 14 are described in the above-referenced patent application and the Choi II Declaration, as further described in the Choi IV Declaration.

The Choi IV Declaration also confirms Wai Ming Choi's belief that the statements made in the Choi III Declaration are accurate and describe experiments that demonstrate that gamma values of at least about 14 did not result when the oppositely charged viscosity modifier teachings of Dong (U.S. Patent No. 6,291,552) are applied to the low-boron glass fibers of Pierce (WO 01/43850).

Rejection of Claims 13-14 and 19-20

1. The Rejection And The Scope And Content Of The Prior Art

Claims 13-14 and 19-20 are rejected pursuant to 35 U.S.C. §103(a) as being obvious over WIPO Published Application No. WO 01/43850 of Pierce et al. ("Pierce") in view of U.S. Patent No. 6,291,552 of Dong ("Dong").

Pierce discloses an "essentially boron free filtration media" useful in environments where humidity and temperature are strictly controlled and release of boron-based contaminants cannot be tolerated. *Pierce* at page 2, lines 18-21. The filtration media of Pierce is formed using glass wool fibers and chopped glass fibers in a wet-laid process. *Id.* at page 14, lines 17-26. Only very specialized low-boron or boron-free fibers are used in order to ensure boron-based contaminants are not later released from the filter media in sensitive clean room environments. *Id.* at page 5, lines 3-7 and 22-31.

Dong discloses methods for producing glass mats that are used as reinforcing elements for roofing shingles, flooring, boat hulls, and food service trays. *Dong* at col. 1, lines 7-17. Dong teaches that the glass mats can be formed using a wet-laid process wherein oppositely charged viscosity modifiers are added during the formation of the glass web in order to provide "control of both the dispersion of glass fibers and subsequent bundling of the fibers...". *Id.* at col. 2, lines 20-28. "By properly sequencing the addition of the oppositely charged viscosity modifiers, the glass fibers may be dispersed in the white water and then attracted together to form bundles." *Id.* For example, a cationic viscosity modifier can be initially added to the slurry to assist in dispersing the glass fibers throughout. *Id.* at col. 6, lines 34-37. An oppositely charged, anionic viscosity modifier can then be added to bring the fibers back together in bundles, thereby creating a stronger mat with increased porosity and even weight distribution. *See Dong* at col. 6, lines 34-37; col. 3, lines 24-27. Such

parameters are desirable in bundled / structured mats used as reinforcing for roofing shingles, etc. *See Dong* at col. 7, lines 31-43; col. 1, lines 7-17.

Independent claim 13 recites a filter media that includes a support layer and a filtration layer. The filtration layer includes glass wool fibers having a diameter in the range of about 0.1 micron to 4.5 micron and the filter media has a gamma value of at least 14.

The Office Action points out that Pierce teaches glass wool fibers having a diameter in the range of 0.1 to 5.0 microns and argues that Pierce also teaches a support layer and a filtration layer because it discloses that the low-boron filtration media can have multiple plies. The Office Action further argues that, although neither Pierce nor Dong even refers to gamma value, much less teaches a filter media having a gamma value of at least 14, a filter media made from a combination of the processes disclosed in Pierce and Dong would *inherently* have such a gamma value. Specifically, the Office Action suggests that the nonwoven filter media taught by Pierce is substantially identical to the claimed nonwoven filter media in structure and that the wet laid process of Dong is a substantially identical wet laid process (lowering the pH and then raising the pH) to one exemplary process disclosed by Applicant as achieving the claimed gamma value. The Office Action argues that the process disclosed in Dong of sequencing the addition of oppositely charged viscosity modifiers to the slurry during formation of the glass web is equivalent to Applicant's process of first adjusting the pH to an acidic level and then subsequently raising the pH to a more alkali level. The Office Action concludes that it appears that the nonwoven filter media made by combining Pierce and Dong inherently possesses the claimed gamma value.

Stated differently, the Office Action argues that it would have been obvious to combine the teachings of Pierce and Dong to improve weight distribution as taught by Dong, and therefore that combining the filter media of Pierce with the pH adjusting process of Dong would result in a filter that inherently possesses a gamma value of at least 14.

Applicant respectfully requests withdrawal of the rejection should because 1) the combination of Pierce and Dong does not inherently result in the claimed gamma value, 2) the references teach away from making such a combination, 3) Dong is non-analogous art, and 4) it is improper to rely on an inherent feature of a combination of references to support an obviousness rejection.

2. The Combination Of Pierce And Dong Does Not Inherently Result In The Claimed Gamma Value.

The claimed filter media having a gamma value of at least 14 is not an inherent result of combining Pierce and Dong.

The Dong-Pierce combination would not inherently result in a filter media having a gamma value of at least 14 because Pierce uses low-boron glass fibers. As explained above, Pierce's nonwoven filter media are "essentially free of boron." *Pierce* at page 5, lines 5-7. Pierce accomplishes this by using only glass wool fibers and chopped glass fibers that each contain less than 0.2% by weight boron, and preferably contain no detectable level or 0% by weight boron. *Pierce* at page 5, lines 22-31. The Declaration of Wai Ming Choi dated March 14, 2008 ("the Choi III Declaration") demonstrates that gamma values of at least 14 do not necessarily result when the oppositely charged viscosity modifier teachings of Dong are applied to the low-boron glass fibers of Pierce. *Choi Declaration* at para. 5; Table B. Rather, the best gamma value Choi, a skilled artisan, could achieve using the teachings of Pierce and Dong was only 13.73. *Id.* at para. 6; Table B. Because gamma value is a logarithmic function, the difference between 13.73 and 14 is substantial, representing a nearly two-fold increase in filtration efficiency. *See Specification* at paras. [0030]-[0031].

The prosecution history of the present application nonetheless suggests that the Choi III Declaration is ineffective to overcome the inherency rejection because the teachings of the applied prior art are not limited to the 6 examples disclosed in the declaration. The Office in essence argues that other potential experiments based on the teachings of Pierce and Dong might have the claimed gamma value. As explicitly set forth in the MPEP however, "Inherency, however, may not be established by probabilities or possibilities. *The mere fact that a certain thing may result from a given set of circumstances is not sufficient." In re Robertson,* 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)." MPEP §2112 (IV) (emphasis added). "Probabilities are not sufficient... A prior inherent event cannot be established based upon speculation or where a doubt exists." *Ethyl Molded Products Co. v. Betts Package Inc.,* 9 USPQ2d 1001, 1032-33 (E.D. Ky. 1988)(citing *In re Oelrich,* 666 F.2d 578, 581 (C.C.P.A. 1981) and *In re Chandler,* 254 F.2d 396 (C.C.P.A. 1958))(emphasis added). The examples in the Choi III Declaration amply demonstrate that

achieving a gamma value of at least 14 from the teachings of Pierce and Dong is speculative at best, if not altogether impossible. Accordingly, the claimed gamma value is not an inherent result of Pierce and Dong and therefore Pierce and Dong are deficient with respect to claim 13.

3. *The Office Action Fails To Provide A Proper Rationale To Combine Pierce And Dong*

Not only has the Office Action disregarded the deficiencies in Pierce and Dong, but the Office Action has simply failed to provide a valid reason to combine these references. "The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." MPEP §2141(III). The Supreme Court in *KSR Int'l. Corp.* v. *Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007), quoting *In re Kahn,* 441 F.3d 977, 988 (Fed. Cir. 2006), stated that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." Here, the only reasoning the Office Action has provided for combining the viscosity modifier process of Dong with the filter media of Pierce is that the resulting filter media would "advantageously possess a uniform weight.".

This argument is flawed however because Pierce already has a uniform weight. Dong requires the use of viscosity modifiers as a dispersant because the structural mats taught therein rely on the use of large filaments of glass which, unlike the relatively small microfibers used in Pierce, have a difficult time dispersing. *See Dong* at col. 3, lines 32-36 and 55-65; *Pierce* at page 6, lines 12-18. The longer filaments of Dong have trouble dispersing not only due to their length, but also because they are coated with a sizing agent. *See Dong* at col. 3, line 66 - col. 4, line 8. The micro-glass fibers used in Pierce have no such sizing agent coating and are much shorter than the filaments in Dong. *See Dong* at col. 3, lines 32-36 and *55-65; Pierce* at page 6, lines 12- 18. As a result, they are able to disperse evenly in the slurry without the addition of a viscosity modifier and therefore adding one would have no hearing on the weight uniformity of the Pierce filters. Accordingly, it would have been useless to add the process steps of Dong to Pierce in order to improve weight distribution, as argued by the Office Action, and therefore no motivation existed to combine these references.

Moreover, no skilled artisan would have been motivated to combine Pierce and Dong

because there is no teaching in either reference that adjusting the pH has a positive impact on gamma value. In fact, if Dong is construed to teach adjusting the pH, as the Office Action argues, then Dong teaches away from the claimed invention. "When the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR v. Teleflex,* 127 S. Ct. 1727, 1740 (2007) (citing *United States v. Adams,* 383 U.S. 39 (1966)). Dong teaches that "[b]y properly sequencing the addition of the oppositely charged viscosity modifiers, the glass fibers may be dispersed in the white water and then attracted together to form bundles." *Dong* at col. 2, lines 25-28. Dong also explains that "mats comprising highly dispersed fibers may be produced by limiting the amount of oppositely charged viscosity modifier used" and that "mats comprising larger bundles may be produced by increasing the amount of oppositely charged viscosity modifier used." *Dong* at col. 7, lines 31-43. In further discussing these mats comprising larger bundles of fibers, Dong states that "[t]hese *bundled mats,* i.e. structured glass mats, generally have a porous structure and a uniform distribution of fiber bundles." *Dong* at col. 7, lines 31-43 (emphasis added). In other words, Dong teaches that adding a second, anionic viscosity modifier pulls the dispersed fibers back together to form bundles, resulting in a mat with increased porosity (increased open areas between bundles). While increased porosity and dense fiber bundles may be advantageous in Dong, where the glass mats are used in structural applications such as roofing shingles, foam headliners, and food service trays, such a property is not at all desirable in the pleated clean room filters contemplated by Pierce. Instead, Pierce discusses the importance of maintaining a low penetration across the filter, where penetration is defined as:

$$Penetration\% = \frac{C}{Co}$$

"where C is the [contaminant] particle concentration after passage through the filter and Co is the [contaminant] particle concentration before passage through the filter." *Pierce* at page 13, lines 7-15. Pierce teaches that "it is desirable that filters, or filter media, be characterized by low penetration across the filter of contaminants to be filtered." *Pierce* at page 13, lines, 7-9. In sum, Pierce strives to keep the penetration low, while the object of Dong's process is to increase penetration.

It would therefore not have been obvious to combine the Dong process of sequencing oppositely charged viscosity modifiers with the Pierce filter materials in an attempt to achieve increased gamma value because Dong explicitly teaches obtaining characteristics that are not desirable with the type of filters disclosed by Pierce.

4. Dong Is Non-Analogous Art That Cannot Be Relied On

Still further, it is inappropriate to rely on Dong at all, as it is non-analogous art. To be analogous, a reference must either be within the field of the inventor's endeavor or be reasonably pertinent to the particular problem with which the inventor was involved. *In re Deminski,* 796 F.2d 436, 442 (Fed. Cir. 1986).

First, the Dong disclosure of highly porous bundled mats used in making roofing shingles, flooring, and boat hulls is clearly outside the field of high-performance micro-glass filtration media for use in clean rooms. The mere fact that Dong and the present invention each use wet-laid glass fibers, as suggested by the Office Action, does not render Dong analogous. The Office Action's reliance on such a broad interpretation of the field of Applicant's endeavor is improper. Second, Dong is not reasonably pertinent to the particular problem with which the Applicant was involved. The subject of the pending application is filter media having enhanced filtration performance characteristics. *Specification* at para. [0002]. The purpose of Dong on the other hand is not to create filters at all, but rather to perform controlled bundling of glass fibers into highly porous structural materials through the use of oppositely charged viscosity modifiers. *Dong* at Abstract. Dong, seeking to produce structural materials such as roofing and flooring, is not concerned with the materials' performance as a filter, and thus sacrifices filter penetration performance in favor of increased "porosity, tensile strength, and tear strength." *See Dong* at col. 1, lines 55-57. Increasing the strength and porosity of structural glass mats is a vastly different problem than improving the performance of filter media. A reference is reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. *In re Clay,* 966 F.2d 656, 659 (Fed. Cir. 1992). Because Dong is directed to an entirely different purpose than the claimed invention, no inventor would be motivated to consider Dong because it is simply not relevant to solving the purpose of the

claimed invention. *See Id.* Accordingly, Dong is non-analogous art and reliance thereon is inappropriate.

5. It Is Improper To Rely On An Inherent Feature Of A Combination Of References To Support An Obviousness Rejection

Finally, while an inherent feature of a *single* reference may be relied upon in making an obviousness rejection (*In re Napier,* 55 F.3d 610, 613 (Fed. Cir. 1995)), an inherent feature of *a combination* of references cannot be relied upon because the presence of the feature would not have been recognized by a person having ordinary skill in the art at the time of invention. *See, e.g., Continental Can Co. v. Monsanto Co.,* 948 F.2d 1264, 1268 (Fed. Cir. 1991) (extrinsic evidence used to fill a gap in a reference "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it *would be so recognized by persons of ordinary skill")* (emphasis added); *Hitzemun v. Rutter,* 243 F.3d 1345, 1355 (Fed. Cir. 2001); *Turbo Care Div. Of Demag Delaval Turbomachinery Corp. v. General Electric Co.,* 264 F.3d 1111, 1119 (Fed. Cir. 2001).

It is important to distinguish inherent *anticipation* rejections made pursuant to 35 U.S.C. § 102 and inherent *obviousness* rejections under 35 U.S.C. § 103. In *Schering Corp. v. Geneva Pharm. Inc.,* 339 F.3d 1373, 1377 (Fed. Cir. 2003), the Federal Circuit rejected the contention that inherent *anticipation* requires recognition by a person of ordinary skill in the art before the critical date of the invention. *Schering* and its progeny are discussed at length in the *anticipation* portion of the MPEP. *MPEP* §2112(II). In the context of *obviousness* however, such recognition *is* required because §103 only permits rejections where the subject matter "would have been obvious at the time the invention was made." *See* 35 U.S.C. § 103 (2000). "Obviousness cannot be predicated on what is not known at the time an invention is made, *even if the inherency of a certain feature is later established." MPEP* §2141.02(V) (citing *In re Rilckaert,* 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cit. 1993)) (emphasis added). The inherency of a feature must therefore be recognizable at the time of invention in order to be relied upon in making an obviousness rejection. *See id.* Combinations proposed by an Examiner, made with the benefit of hindsight, are merely that - *proposed.* Undisclosed "inherent" properties of a combination that has never actually been made, much less

made prior to the time of Applicant's invention, would by definition not be apparent or recognizable to a person of ordinary skill in the art at the time of invention. A feature inherent in a combination thus cannot be relied upon in making an obviousness rejection.[1]

6. Conclusion

In conclusion, for at least all of the aforementioned reasons, independent claim 13 is not obvious over Pierce and Dong, taken alone or in combination. Dependent claims 14 and 19-20 depend from independent claim 13, and therefore distinguish over Pierce and Dong at least because they depend from claim 13. Accordingly, Applicant respectfully requests withdrawal of the claim rejections on this ground.

Rejection of Claims 16 and 17

1. The Rejection And The Scope And Content Of The Prior Art

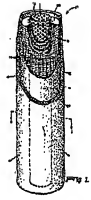
Claims 16-17 are rejected pursuant to 35 U.S.C. §103(a) as being obvious over WIPO Published Application No. WO 01143850 of Pierce et al. ("Pierce") in view of U.S. Patent No. 6,291,552 of Dong ("Dong") as applied to claims 13-14 and 19-20 above and further in view of U.S. Patent No. 4,102,785 to Head ("Head").

Head provides an "improved disposable filter cartridge designed for flow in the inside-to-

[1] One earlier case implies that such reliance may in fact be permissible. *See In re Roberts*, 470 F.2d 1399 (C.C.P.A. 1973). In *Roberts*, claims directed to a corrugated PET film having a surface coefficient of friction of less than about 0.40 wore rejected as being obvious over two references. *Id.* at 1400. The first, a patent to Roberts, taught a corrugated PET film. *Id.* The second, an Australian Patent, taught adding a filler to a non-corrugated film. *Id.* Although the Australian patent provided no purpose for adding the filler, the Appellants' own specification stated that adding a filler is one way of decreasing the surface coefficient of friction of the film. *Id.* The Board affirmed the Examiner's rejection and said, regarding reducing the surface coefficient of friction, that "such result is inherent in the obvious combination of these references." *Id.* at 1400-01. The C.C.P.A. reversed, however, finding that the claimed surface area would not inherently result from the combination of the Roberts film and the Australian Patent's filler because at least some combinations of the two would not result in the claimed coefficient. *Id.* at 1401. Although the rejection was ultimately reversed, the court appears to have impliedly recognized the viability of an obviousness rejection based on inherent features of a combination. *See id.* Applicant contends that, to the extent *Roberts* recognizes such rejections as permissible; it *is* incorrect and should not be followed.

Two other early cases, *In re Shannon*, 327 F.2d 518 (C.C.P.A. 1964) and *In re Alford*, 300 F.2d 929 (C.C.P.A. 1962), also mention inherent results of a combination. These cases are distinguishable however because in each, the so-called "inherent result" was not actually claimed, but was rather the unexpected result that the Appellant offered as evidence of non-obviousness. *See Shannon* at 520-21; *Alford* at 931-33. Since gamma value, the supposedly inherent feature in the instant case, *is* explicitly recited in the claims on appeal, *Shannon* and *Alford* do not apply.

outside direction." *Head at* col. 2, lines 64-66. As shown in Figure 1 of Head, reproduced below, a tubular filter assembly is provided. The assembly (10) includes a perforated metal tube (18) surrounded by a coarse-glass pre-filter mat (16), a porous scrim-woven sheet material (14), and a filter tube wall (18) formed of bonded glass fibers. *Head at* col. 6, lines 50-68. The entire assembly is surrounded by an open-cell urethane-foam-coalescent filter (24) and is retained at the ends by an end cap (20). *Id.*



Claim 16 recites the filter media of claim 13, wherein the filter media has an apparent density of at least 0.15 g/cc. Claim 17 recites the filter media of claim 16, wherein the filter media has an apparent density in the range of about 0.15 g/cc to 0.21 g/cc.

The Office Action argues that while Pierce does not disclose the apparent density of the web, it would have been obvious to look to Head for conventional web densities. In support of this proposition, the Office Action refers to a single passage in Head that states: "[I]n typical filter tubes, the wall thickness would range from about 0.100 to 0.200 inches... with *a fiber* density of about 0.15 to 0.25 grams/cc". *Head* at col. 4, lines 53-55 (emphasis added).

2. Head Fails To Remedy The Deficiencies Of Pierce And Dong

As explained above with respect to claim 13, from which claims 16 and 17 ultimately depends, Pierce and Dong are deficient because they lack a filter media having the claimed gamma value. Head fails to remedy this deficiency because it too lacks any teaching or suggestion that would lead a skilled artisan to achieve the claimed gamma value of at least 14.

3. Head Fails To Teach The Claimed Apparent Density And Lacks A Teaching As To How The Density Specified Is Achieved

Head further fails to remedy the deficiencies of Pierce and Dong because Head fails to teach the claimed apparent density. The *apparent density* of a *filter media* is not the same as the *fiber density* of the *fibers* used to form the filter media. The apparent density is determined based on the thickness and the basis weight of the resulting filter media, whereas the fiber density is more

like the specific gravity of the individual fibers used to form the filter media. Accordingly, Head, which only mentions fiber density in passing and makes no mention whatsoever of the apparent density of the filter, does not remedy the deficiencies of Pierce and Dong.

Moreover, even if Head could somehow be construed to have the claimed apparent density, the apparent density cannot merely be "set" to a specific value as desired. It has to be obtained. Just because one reference was able to obtain a certain density using a given set of materials and processes, does not mean a person having ordinary skill in the art could simply transpose that density to a completely different set of materials and processes. In other words, no skilled artisan could simply rely on Head, or any other reference for that matter, to teach a certain apparent density, and then merely decide that the Pierce filter materials will have that density. To the contrary, they would have to modify the process and/or materials of Pierce based on the teachings of the prior art. The Office Action has failed to explain how Pierce could be modified in view of Head to arrive at the claimed apparent density, much less how it could be done while maintaining a gamma value of at least 14, as also required by claims 16-17. Furthermore, the Office Action has failed to provide any motivation for making such a modification.

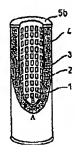
4. Conclusion

Accordingly, claims 16-17 are not obvious over Pierce, Dong, or Head, taken alone or in combination, and therefore these claims represent allowable subject matter. Applicant respectfully requests withdrawal of the claim rejections on this ground.

Rejection of Claim 18

1. The Rejection And The Scope And Content Of The Prior Art

Claim 18 is rejected pursuant to 35 U.S.C. §103(a) as being obvious over WIPO Published Application No. WO 01/43850 of Pierce et al. ("Pierce") in view of U.S. Patent No. 6,291,552 of Dong ("Dong") as applied to claims 13-14 and 19-20 above and further in view of U.S. Patent No. 6,749,753 to Yamaguchi ("Yamaguchi").



Yamaguchi discloses a multi-layer filter comprised of nonwoven fibrous agglomerates. *Yamaguchi* at col. 2, lines 28-50. Figure 1 of Yamaguchi, reproduced herein, illustrates a filter assembly that includes a support layer (2), a precision filter layer (3), and a pre-filtration layer (4) disposed around a porous support cylinder (1). *Id.* at col. 9, lines 17-35. Two end caps (5a, 5b) seal the end portions of the assembly. *Id.*

Claim 18 recites the filter media of claim 14, wherein the glass fibers in the support layer have a fiber diameter of about 4.2 micron and the glass wool fibers that form the filtration layer have a fiber diameter of about 0.69 micron. The Office Action concedes that Pierce does not mention using a larger fiber diameter in one of the support plies, and instead relies on Yamaguchi.

2. Yamaguchi Fails To Remedy The Deficiencies Of Pierce And Dong

As explained above with respect to claim 13, from which claim 18 ultimately depends, Pierce and Dong are deficient because they lack a filter media having the claimed gamma value. Yamaguchi fails to remedy this deficiency because it too lacks any teaching or suggestion that would lead a skilled artisan to achieve the claimed gamma value of at least 14.

3. Conclusion

Accordingly, claim 18 is not obvious over the combination of Pierce, Dong and Yamaguchi, and this claim represents allowable subject matter. Applicant respectfully requests withdrawal of the claim rejections on this ground.

Rejection of Claims 1-17 and 19-20

Claims 1-17 and 19-20 are rejected pursuant to 35 U.S.C. §103(a) as being obvious over WIPO Published Application No. WO 01/43850 of Pierce et al. ("Pierce") in view of U.S. Patent No. 6,291,552 of Dong ("Dong") and further in view of U.S. Patent No. 6,420,024 to Perez ("Perez").

1. Claims 1-7

a. The Rejection And The Scope and Content Of The Prior Art

Independent claim 1 recites a nonwoven filter media that includes at least one glass wool fiber web having a gamma value of at least 14, and a surface area of at least 1.2 m^2/g. In an argument substantially identical to that discussed above for claim 13, the Office Action alleges that Pierce and Dong could be combined to inherently possess the claimed gamma value. The Office Action then concedes that Pierce is silent with respect to the claimed surface area but argues that it would have been obvious to look to the prior art for conventional surface areas, and that Perez provides such a conventional teaching.

Perez discloses "highly oriented, melt processed *polymeric* microfibers" and films formed therefrom. *Perez at* col. 1, lines 66-67; col. 2, lines 23-25 (emphasis added). The micro fibers have an effective average diameter of less than 20 microns and have a substantially *rectangular* cross-section. *Id.* at col. 2, lines 1-7 (emphasis added). Perez states that "[t]he surface area [of the microfibers] is generally greater than about 0.25 m^2/gram, typically about 0.5 to 30 m^2/g." Perez at col. 2, lines 13-14.

b. None Of The References Teach The Claimed Gamma Value

For the same reasons previously explained above with regard to independent claim 8, the claimed filter media having a gamma value of at least 14 is not an inherent result of combining Pierce and Dong, and the Office Action has simply failed to provide a valid reason to combine these references. Perez fails to remedy the deficiencies of Pierce and Dong because it too is completely devoid of any teaching of gamma value, much less of how one could modify Pierce and Dong to reach a gamma value of at least 14. Perez is simply relied on to teach fibers having a specified surface area and contains no teachings relating to efficiency. Moreover, as previously explained it is inappropriate to rely on Dong at all, as it is non-analogous art.

c. Perez Cannot Be Combined With Pierce And Dong To Arrive At The Claimed Surface Area

Furthermore, Perez cannot be combined with Pierce and Dong to arrive at the claimed surface area. First, Perez relies on using *polymeric* microfibers having a *rectangular* cross-section to

arrive at the disclosed surface area. Pierce on the other hand uses *glass* fibers having a *non-rectangular* cross-section. Therefore, the only way to modify Pierce to arrive at the Perez surface area would be to perform a wholesale replacement of Pierce's round, glass fibers with Perez's rectangular, polymeric fibers. Claim 1, however, expressly requires a *glass* fiber web, thus such a modification would not result in the claimed invention. Second, it would not have been obvious to modify Pierce in view of Perez. Swapping the low-boron glass fibers of Pierce for the polymeric fibers of Perez defeats the entire purpose of the Pierce invention — to provide filters that will not contaminate sensitive areas with boron particles. Third, even if Pierce and Perez could somehow be combined while overcoming these hurdles, the Office Action has not provided any reason why a skilled artisan would do so, or any evidence that such a modification is even possible while also achieving a gamma value of at least 14, as also required by claim 1.

d. Perez Is Non-Analogous Art That Cannot Be Relied On

Finally, it is improper to rely on Perez at all in making an obviousness rejection because Perez is non-analogous art. While both Perez and the Applicants are concerned with filters, the Applicant's invention relates to glass micro-fibers, not polymeric fibers as used throughout Perez. As stated above, in order to be analogous, a reference must either be within the field of the inventor's endeavor or be reasonably pertinent to the particular problem with which the inventor was involved. *In re Deminski,* 796 F.2d 436, 442 (Fed. Cir 1986). Charged *polymeric* fibers are not within Applicant's field of improving performance of *micro-glass* filters. In addition, Perez is not reasonably pertinent to the particular problem with which the Applicant was involved. A reference is reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his or her problem. *In re Clay,* 966 F.2d 656, 659 (Fed. Cir. 1992). An inventor seeking to improve the filtration characteristics of micro-glass filter media would not direct their attention to references that deal exclusively with polymeric fibers because such fibers use completely different manufacturing techniques and have completely different properties than glass. Because Perez is directed to an entirely different field than the claimed invention, no inventor would have been motivated to consider Perez because it is simply not relevant to solving the purpose of the claimed invention. *See Id.* Accordingly, Perez is

non-analogous art and reliance thereon is inappropriate.

e. Conclusion

In sum, for at least the reasons discussed above, independent claim 1 is not obvious over Pierce, Dong, or Perez, taken either alone or in combination. Claims 2-7 distinguish over Pierce, Dong, and Perez at least because they depend from claim 1.

2. Claims 8-12

a. The Rejection

Independent claim 8 recites a nonwoven filter media that includes at least one glass fiber web having a gamma value of at least 14, and an apparent density of' at least 0.15 g/cc. The Office Action offers the same argument as that discussed above with respect to claim 1, specifically that Pierce and Dong could be combined to inherently possess the claimed gamma value. Perez is merely relied on in this rejection to teach "conventional" surface areas, a limitation which is *not* present in any of claims 8-12. Rather, with respect to claims 8-12, the Office Action simply concedes that Pierce, Dong, and Perez each lack the claimed apparent density, but argues that the filter media which results from combining these three references would inherently have such an apparent density because the resulting filter media would have an identical surface area and be made from a substantially identical wet laid process.

b. None Of The References, Taken Alone Or Combined, Teach Or Inherently Posses A Gamma Value Of At Least About 14

As explained above with respect to the rejection of claim 13 over Pierce and Dong and with respect to the rejection of claim 1 over Pierce, Dong, and Perez, no combination of Pierce, Dong, and Perez teaches or even inherently possesses a gamma value of at least 14, as required by claim 8. Moreover, even if these references could be construed to teach such a gamma value, there would have been no motivation to combine them, and in fact, Dong teaches away from making such a combination. Accordingly, each of the cited references is deficient with respect to the gamma value limitation of claim 8.

c. None Of The Reference Teach The Claimed Apparent Density

In addition, Pierce, Dong, and Perez are deficient with respect to the claimed apparent density of at least 0.15 g/cc. The Office Action argues that the filter media which results from combining these references would *inherently* have the claimed apparent density because the resulting filter media would have an identical surface area and be made from a substantially identical wet laid process. First, the wet laid processes of these references are not substantially the same as in Applicant's invention. Unlike Applicant, Dong must ensure that its long, surface-coated glass filaments are adequately dispersed and seeks to bundle the filaments for making highly structured, porous mats. *See Dong* at col. 3, lines 32-36 and 55-65; col. 3, line 66 - col. 4, line 8. The sequencing of oppositely charged viscosity modifiers used in Dong to accomplish this is not even relevant to, much less "substantially the same as" Applicant's wet laid process as argued by the Office Action.

Second, as discussed above, the surface area disclosed in Perez is achieved by using rectangular, polymeric fibers. *Perez at* col. 1,1n. 66 - col. 2, line 22. The Office Action fails to explain how Pierce could he modified to have the same surface area without performing a complete swap of the Pierce non-rectangular glass fibers for the rectangular polymeric fibers of Perez, In addition, there is no explanation as to why a person of ordinary skill would be motivated to make such a combination, nor how such a combination could also achieve the claimed gamma value and still maintain the boron-free properties of Pierce.

Even if one could somehow overcome all of these hurdles to achieve a similar process or similar surface area, there is no evidence that these factors are necessarily correlated to apparent density. The Office Action's unsupported assertion that surface area and process similarities somehow translate into the claimed apparent density does not meet the burden to provide "a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art." *See Ex parte Levy,* 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Interferences, 1990) (emphasis added). Rather, "[t]he doctrine of inherency is available *only* when the prior inherent event can be established as a *certainty*." *Ethyl Molded Products Cu. v. Betts Package Inc.,* 9 USPQ2d 1001, 1032-33 (E.D. Ky.

1988)(citing *In re Oelrich,* 666 F.2d 578, 581 (C.C.P.A. 1981) and *In re Chandler,* 254 F.2d 396 (C.C.P.A. 1958))(emphasis added). "Probabilities are not sufficient... A prior inherent event cannot be established based upon speculation or where a doubt exists." *Id.* The mere possibility that similar surface area or similar process steps *might* lead one to the claimed apparent density is insufficient to establish a rejection based on inherency. "To establish inherency, the extrinsic evidence 'must make clear that the *missing* descriptive matter is *necessarily present* in the thing described in the reference, and that *it would be so recognized by persons of ordinary skill.'* ... 'Inherency, however, may not be established by probabilities or possibilities. *The mere fact that a certain thing may result from a given set of circumstances is not sufficient." In re Robertson,* 169 F.3d 743, 745 (Fed. Cir. 1999) (emphasis added).

d. Conclusion

Accordingly, Pierce, Dong and Perez are each deficient with respect to the claimed gamma value and the claimed apparent density. Claim 8 is therefore not obvious over Pierce, Dong, or Perez, taken alone or in combination and claims 9-12 are likewise non-obvious at least because they depend from claim 8.

3. Claims 13-17 and 19-20

a. The Rejection

Independent claim 13 recites a filter media that includes a support layer and a filtration layer. The filtration-layer includes glass wool fibers having a diameter in the range of about 0.1 to about 4.5 microns and the filter media has a gamma value of at least 14. The Office Action argues that the combination of Pierce and Dong would inherently possess the claimed gamma value and that Pierce discloses the use of multiple plies in the filter media.

b. Claims 13-17 and 19-20 Distinguish Over Pierce, Dong, and Perez

It is not specified how Perez is relied upon to reject claim 13, and the inclusion of claims 13-17 and 19-20 in this rejection appears to be in error as Perez is only relied on to teach surface area - a limitation which is not present in independent claim 13. Perez does not contain any teachings that

would remedy the deficiencies of Pierce and Dong with respect to the claimed gamma value. Thus, for the same reasons discussed above with respect to the rejection of claim 13 over only Pierce and Dong, claim 13 is not obvious over Pierce, Dong, or Perez, taken alone or in combination.

c. Conclusion

Claim 13 thus represents allowable subject matter and claims 14-17 and 19-20 are allowable at least because they depend from an allowable base claim. Accordingly, Applicant respectfully requests withdrawal of the claim rejections on this ground.

Rejection of Claim 18

Claim 18 is rejected pursuant to 35 U.S.C. §103(a) as being obvious over WIPO Published Application No. WO 01/43850 of Pierce et al. ("Pierce") in view of U.S. Patent No. 6,291,552 of Dong ("Dong") in view of U.S. Patent No. 6,420,024 to Perez ("Perez") as applied to claims 1-17 and 19-20 above and further in view of-U.S. Patent No. 6,749,753 to Yamaguchi ("Yamaguchi").

Claim 18 depends from claim 13, and thus for the same reasons discussed above with respect to claim 13, Yamaguchi fails to remedy the deficiencies in Pierce and Dong. Accordingly, claim 18 is not obvious over these references and represents allowable subject matter.

Accordingly, Applicant respectfully requests withdrawal of the claim rejection on this ground.

Rejection of Claims 8-12 and 16-17

Claims 8-12 and 16-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Pierce in view of Dong in view of Perez as applied to claims 1-17 and 19-20 above, and further in view of Head.

1. Claims 8-12

a. The Rejection

Independent claim 8 recites a nonwoven filter media that includes at least one glass fiber

web having a gamma value of at least 14, and an apparent density of at least 0.15 g/cc. The Office Action argues that, while Pierce does not disclose the apparent density of the web, Head discloses that "it is known and typical in the filter art to use a fiber density of about 0.15 to 0.25g/cc." In support of this proposition, the Examiner refers to a single passage in Head that states: "[I]n typical filter tubes, the wall thickness would range from about 0.100 to 0.200 inches... with *a fiber* density of about 0.15 to 0.25 grams/cc". *Head* at col. 4, lines 53-55 (emphasis added).

b. None Of The References Teach The Claimed Gamma Value

At the outset, the inclusion of Head here appears to be an admission that the Office Action's previous rejection of claims 8-12 over Pierce, Dong, and Perez is insufficient to render claims 8-12 obvious. Regardless, for the same reasons previously explained above with regard to independent claim 8, the claimed filter media having a gamma value of at least 14 is not an inherent result of combining Pierce and Dong, and the Office Action has simply failed to provide a valid reason to combine these references. Perez does not remedy this deficiency of Pierce and Dong, as explained above with regard to independent claim 1. Head likewise fails to remedy the deficiencies of Pierce, Dong, and Perez because it too is completely devoid of any teaching of gamma value, much less of how one could modify Pierce, Dong, and Perez to reach a gamma value of at least 14. Head is simply relied on to teach apparent density and contains no teachings relating to efficiency. Moreover, as previously explained it is inappropriate to rely on Dong and Perez at all, as both references are non-analogous art.

c. None Of The References Teach The Claimed Apparent Density

The Examiner relies on Head to teach the claimed apparent density, however as discussed above with respect to the rejection of claims 16-17, Head does not teach apparent density. The *apparent density* of *a filter media* is not the same as the *fiber density* of *the fibers* used to form the filter media. The apparent density is determined based on the thickness and the basis weight of the resulting filter media, whereas the fiber density is more like the specific gravity of the individual fibers used to form the filter media. Accordingly, Head, which only mentions fiber density in passing and makes no mention whatsoever of the apparent density of the filter, does not remedy the

deficiencies of Pierce and Dong.

Moreover, as explained above with respect to the rejection of claims 16-17, even if Head could somehow be construed to have the claimed apparent density, the apparent density cannot merely be "set" to a specific value as desired. It has to be obtained. Just because one reference was able to obtain a certain density using a given set of materials and processes, does not mean a person having ordinary skill in the art could simply transpose that density to a completely different set of materials and processes. In other words, no skilled artisan could simply rely on Head, or any other reference for that matter, to teach a certain apparent density, and then merely decide that the Pierce filter materials will have that density. To the contrary, they would have to modify the process and/or materials of Pierce based on the teachings of the prior art. The Office Action has failed to explain how Pierce could be modified in view of Head to arrive at the claimed apparent density, much less how it could be done while maintaining a gamma value of at least 14, as also required by claim 8. Furthermore, the Office Action has failed to provide any motivation for making such a modification.

d. Conclusion

Accordingly, independent claim 8 is not obvious over Pierce, Dong, Perez, or Head, taken alone or in combination, and therefore claim 8 represents allowable subject matter. Claims 9-12 are allowable at least because they depend from an allowable base claim.

2. Claims 16-17

a. The Rejection

Claim 16 recites the filter media of claim 13, wherein the filter media has an apparent density of at least 0.15g/cc. Claim 17 recites the filter media of claim 16, wherein the filter media has an apparent density in the range of about 0.15g/cc to 0.21g/cc. Claims 16 and 17 both depend ultimately from independent claim 13, which requires a filter media having a gamma value of at least 14. The Office Action argues that the combination of Pierce and Dong would inherently possess such a gamma value and that Head discloses "that it is known and typical in the filter art to use a fiber density of about 0.15 to 0.25 g/cc."

b. The Combination Of Pierce, Dong, Perez, And Head Does Not Result In A Filter Media Having The Claimed Apparent Density

For the same reasons discussed above with respect to claims 8-12, the Office Action's reliance on Head does nothing to resolve the deficiencies in Pierce and Dong with respect to gamma value, nor does it teach how the claimed apparent density can be achieved since it simply lacks any teachings relating to apparent density.

c. Conclusion

Accordingly, claims 16-17 are not obvious over Pierce, Dong, Perez, or Head, taken alone or in combination, and therefore these claims represent allowable subject matter.

New Claim

New claim 31 depends from claim 5 and, thus, is allowable over the cited prior art for the same reasons that claim 5 is allowable noted above.

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